

02/14/97

Case Docket No. \_\_\_\_\_

THE COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Inventor: John R. Smith

For: Adjustable Log Splitting Head

Enclosed are:

☒ 2 sheets of drawing.☐ An assignment of the invention to \_\_\_\_\_☐ A certified copy of a \_\_\_\_\_ application.☐ An associate power of attorney.☒ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.☐

The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)
FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	-20=	*
INDEP CLAIMS	-3=	*
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENTED		

\* If the difference in Col. 1 is less than zero, enter "0" in Col. 2

## SMALL ENTITY

RATE	FEE
	\$
x =	\$
x =	\$
+ =	\$
TOTAL	\$ 385

## OTHER THAN A SMALL ENTITY

RATE	FEE
	\$
x =	\$
x =	\$
+ =	\$
TOTAL	\$

- ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_. A duplicate copy of this sheet is enclosed.
- ☒ A check in the amount of \$ 385 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 18-0050. A duplicate copy of this sheet is enclosed.
- ☒ Any additional filing fees required under 37 CFR 1.16.
- ☒ Any patent application processing fees under 37 CFR 1.17.
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- ☒ Any patent application processing fees under 37 CFR 1.17.
- ☐ The issue fee set in 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).
- ☒ Any filing fees under 37 CFR 1.16 for presentation of extra claims.

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TITLE:     ADJUSTABLE LOG SPLITTING HEAD

BACKGROUND OF THE INVENTION

1.     Field of the Invention

5             This invention relates to apparatus for the splitting of wooden logs into small pieces useful as firewood.

2.     Description of the Prior Art

10             Devices for converting logs into firewood generally employ a ram-type mechanism which forces logs of pre-cut length into a stationary wedge having sharpened edges. As the log is axially advanced into the wedge, the log splits into a plurality of sector-shaped pieces along cleavage lines that are generally directed radially with respect to the center axis and along medullar rays of the log. Typical examples of such devices are  
15             disclosed in U.S. Patents 4,294,295; 4,353,401; 4,371,019; 4,371,020; and 5,287,902.

20             The diameter of the logs fed to the splitting wedge may vary between about 4" and 24". The larger diameter logs must be cut into a greater number of pieces than the smaller diameter logs. In the course of cutting a sequence of logs, it often happens that logs of widely different diameter are encountered, thereby requiring frequent adjustment of the apparatus so that the appropriate number of pieces are generated from each log. Such adjustment of the splitting conditions of the apparatus requires  
25             considerable operator time, thereby increasing the cost of the log-splitting operation.

30             U.S. Patent 4,371,019 discloses a wedge which is adjustably positionable so as to center upon the log axis. However, none of the aforesaid patents disclose apparatus which permits quick and easy adjustment of the number of pieces to be generated from a given log.

Accordingly, a primary object of the present invention is to provide a wedge head for a log splitting apparatus whereby adjustment can be made so as to change the number of pieces that a given log will be split into.

It is another object of this invention to provide a wedge head as in the foregoing object wherein the adjustability of the splitting characteristic can be easily and quickly accomplished.

It is a further object of the present invention to provide a wedge head of the aforesaid nature which is of rugged and simple design amenable to low cost manufacture.

These objects and other objects and advantages of the invention will be apparent from the following description.

#### SUMMARY OF THE INVENTION

The above and other beneficial objects and advantages are accomplished in accordance with the present invention by an adjustable multi-wedge splitting head for a log splitting apparatus equipped with a ram and guide means for axially advancing pre-cut logs in a horizontal direction, said splitting head comprising:

- a) a vertically oriented stationary post of substantially uniform rectangular cross-sectional configuration bounded by opposed front and rear flat surfaces, paired side surfaces, and upper and lower extremities,
- b) an elongated straight stationary splitting wedge disposed in vertical orientation forwardly of said front surface,
- c) upper and lower multiple splitting wedge assemblies slideably mounted upon and removable from said post, and
- d) activating means which controllably slide said multiple

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A  
wedges upon said post.

BRIEF DESCRIPTION OF THE DRAWING

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawing:

Figure 1 is a rear and side perspective view showing an embodiment of the splitting head of the present invention in association with a conventional log splitting apparatus.

Figure 2 is a side view, partially in section, of the splitting head and apparatus of Figure 1.

Figure 3 is a rear view of the splitting head of Figure 1.

Figure 4 is a front view of the splitting head.

Figure 5 is a sectional view taken in the direction of the arrows upon the line 5-5 of Figure 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, a mobile log splitting apparatus, generally designated 10, embodying the present invention is shown comprised of a chassis or framework, generally designated 11, which includes spaced longitudinally extending side members 12, joined by spaced cross members 13, to form a unitary structure. The chassis 11 is mounted on four wheels 14 in a conventional manner and is provided with a conventional trailer tongue 15 whereby the log splitting apparatus 10 may be attached, for example, to a pickup truck, tractor or other prime mover and transported to a desired location.

A generally V-shaped open top guide chute 16 is mounted on

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chassis 11 and extends longitudinally thereof, said guide chute  
being comprised of a pair of inclined side walls 17 and 18  
supported at the apex of the V by a longitudinally extended  
stringer 19 on chassis 11. The side walls 17 and 18 are also  
5 supported by a framework, generally designated 20 carried by the  
chassis 11.

A drive member 21, shown having a V-shaped contour is  
mounted for reciprocal movement in the generally V-shaped  
passageway 22 defined by side walls 17 and 18 of chute 16. In  
10 other equivalent embodiments, said drive member may have other  
contours while maintaining a substantially flat rear face 65.  
Said reciprocal movement of drive member 21 is achieved through  
the agency of a hydraulic ram 23 having a distal extremity 24  
that engages the front face of drive member 21. The proximal  
15 extremity 25 of ram 23 is secured by way of clevis 26 and pin 27  
to a vertically extending beam 28 which forms a part of framework  
20.

In the illustrated embodiment, a multiple wedge splitting  
head 29 of the present invention is mounted on support beam 31  
20 attached to framework 20 adjacent the exit rear end 30 of guide  
chute 16. Splitting head 29 includes an elongated straight  
stationary splitting wedge 32 of triangular shape disposed in  
vertical orientation and centered upon a plane of symmetry 33  
that bisects the V-shape of guide chute 16. The forwardly  
25 directed cutting edge 66 of wedge 32 is disposed within said  
plane of symmetry.

A vertically oriented stationary post 34 of substantially  
uniform rectangular cross sectional configuration is positioned  
rearwardly of wedge 32 in alignment therewith in centered  
30 relationship upon plane 33. Post 34 is bounded by opposed flat  
front and rear surfaces 35 and 36, respectively, paired flat side

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surfaces 37, and upper and lower extremities 38 and 39, respectively. It is to be noted that, whereas lower extremity 39 abuts against support beam 31, to which it is attached, upper extremity 38 is free and unencumbered. In alternative  
5 embodiments, however, supporting arms attached to framework 20 may removably engage the upper extremity of post 34.

A lower multiple splitting wedge assembly 40 includes a collar 41 slideably positionable upon post 34, and comprised of forward and back panels 51 and 52, respectively, and opposed side  
10 panels 53. Wedge members 42 are horizontally emergent from side panels 53 and have forwardly directed sharp edges 52. Activating means in the form of hydraulic cylinder 45 having piston rod 46, is interactive between control tab 44 rearwardly emergent from back panel 52, and lower securing means in the form of L-shaped  
15 bracket beam 47 pendently secured to support beam 31.

An upper multiple splitting wedge assembly 48 includes a collar 49 slideably positionable upon post 34, and comprised of forward and back panels 54 and 55, respectively, and opposed side  
20 panels 56. An upper pair of wedge members 57 is emergent from side panels 56 in upwardly angled disposition. A lower pair of wedge members 58 is emergent from side panels 56 in downwardly angled disposition. All said wedge members have forwardly directed sharp edges 43. A control tab 59 is attached to back panel 55. Activating means in the form of hydraulic cylinder 60  
25 having piston rod 61 is interactive between control tab 59 and upper securing means in the form of overhead beam 72 attached to framework 20.

In the operation of the splitting head of the present invention, a log 63 having a pre-cut length of between about 15  
30 and 25 inches is dropped into chute 16 from overhead supply means. Drive member 21 is then urged against the log by ram 23,

an action which forces the opposite extremity of the log into contact with stationary vertical wedge 32, with consequent cleavage of the log into two halves.

When upper wedge assembly 48 is positioned above the log, and lower wedge assembly 40 is centered upon the axis of the log, the two horizontally disposed wedge members 42 split in two the two halves of the log, thereby producing four pieces of firewood from the initial log. Alternatively, when, lower wedge assembly 40 is positioned below the log and, upper wedge assembly 48 is centered upon the axis of the log, the upper and lower pairs of wedge members split into three sectors each half of the log, thereby producing six pieces of firewood from the initial log.

For further adjustability, the upper wedge assembly 48 can be easily removed from post 34 by upward movement, and replaced with an assembly having three pairs of wedge members, thereby producing eight pieces of firewood from the initial log.

In an alternative embodiment of the adjustable multi-wedge splitting head of the present invention, the vertical post is not employed, and the wedge assemblies are slideably mounted upon and removable from the stationary splitting wedge

While particular examples of the present invention have been shown and described, it is apparent that changes and modifications may be made therein without departing from the invention in its broadest aspects. The aim of the appended claims, therefore is to cover all such changes and modifications as fall within the true spirit and scope of the invention.



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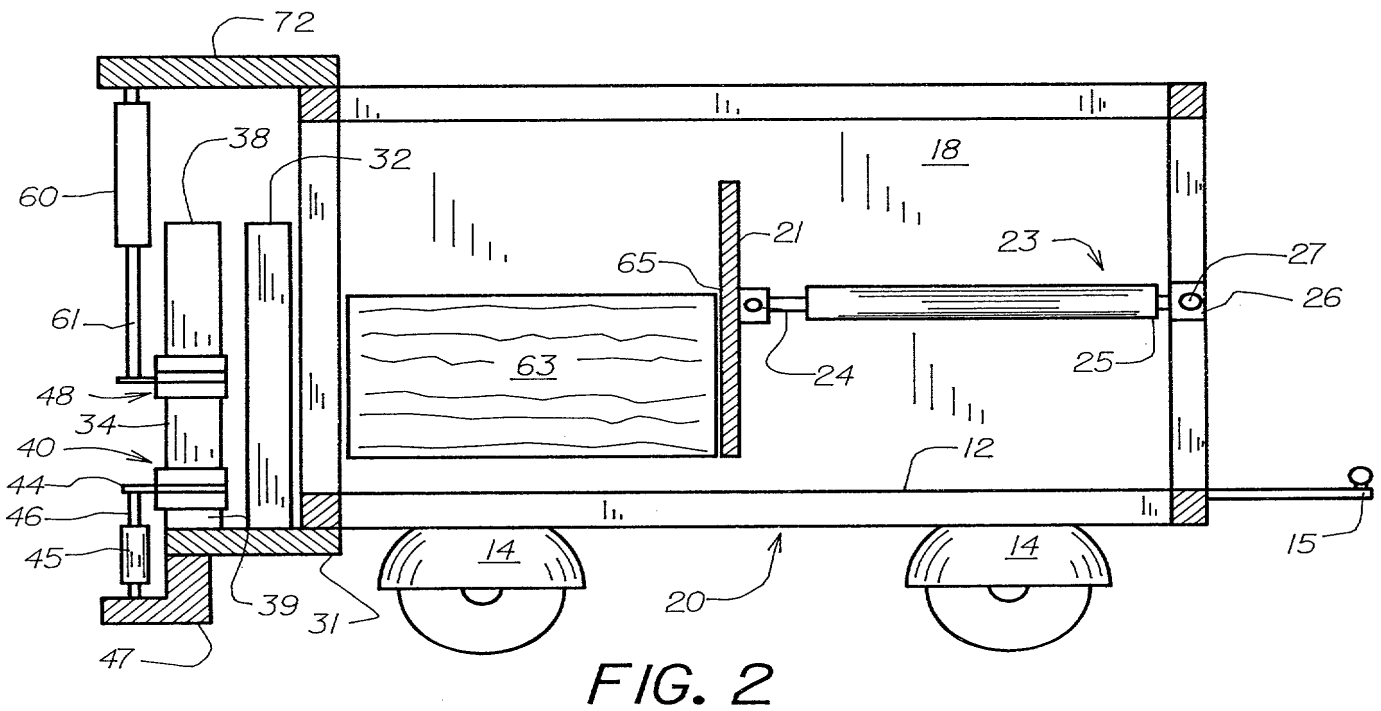
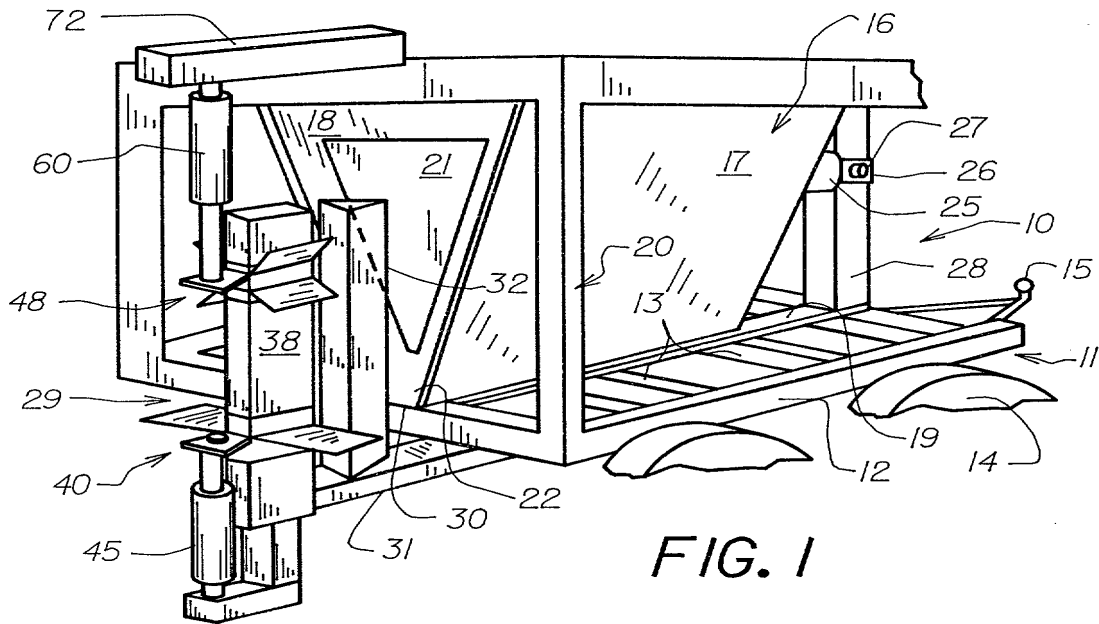
Having thus described my invention, what is claimed is:

- 1) An adjustable multi-wedge splitting head for a log splitting apparatus equipped with a ram and guide means for axially advancing pre-cut logs toward said splitting head in a horizontal direction, said splitting head comprising:
  - a) a vertically oriented stationary post of substantially uniform rectangular cross-sectional configuration bounded by opposed front and rear flat surfaces, paired side surfaces, and upper and lower extremities,
  - b) an elongated straight stationary splitting wedge disposed in vertical orientation forwardly of said front surface,
  - c) upper and lower multiple splitting wedge assemblies slideably mounted upon and removable from said post, and
  - d) activating means which controllably slide said multiple splitting wedge assemblies upon said post.
- 2) The splitting head of claim 1 wherein said guide means is of generally upwardly opening V-shaped contour.
- 3) The splitting head of claim 2 having a vertical plane of symmetry that bisects said guide means.
- 4) The splitting head of claim 3 wherein said stationary splitting wedge is of triangular shape, having a forwardly directed cutting edge disposed within said plane of symmetry.
- 5) The splitting head of claim 1 wherein said activating means are hydraulic cylinders.
- 6) The splitting head of claim 1 wherein each wedge assembly is comprised of a collar slideably positionable upon said stationary post and having forward, back and opposed side panels, and wedge members emergent from said side panels.

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- 7) The splitting head of claim 1 wherein the back panel of said collar is provided with a control tab which engages said activating means.
- 8) The splitting head of claim 1 wherein said splitting wedge assemblies can be removed from said post by sliding upward beyond the upper extremity of said post.
- 9) The splitting head of claim 1 wherein said log splitting apparatus is further equipped with an exterior framework that serves to secure the various components of said apparatus.
- 10) The splitting head of claim 9 wherein said activating means is interactive between said framework and said splitting wedge assemblies.
- 11) A log splitting apparatus comprising a wheeled framework having a ram and guide means for axially advancing pre-cut logs in a horizontal direction toward a splitting head of claim 1.
- 12) An adjustable multi-wedge splitting head for a log splitting apparatus equipped with a ram and guide means for axially advancing pre-cut logs toward said splitting head in a horizontal direction, said splitting head comprising:
- a) an elongated straight stationary splitting wedge disposed in vertical orientation,
  - b) upper and lower multiple splitting wedge assemblies slideably mounted upon and removable from <sup>said</sup> splitting wedge, and
  - c) activating means which controllably slide said multiple splitting wedge assemblies upon said splitting wedge.

ABSTRACT OF THE DISCLOSURE

An adjustable multi-wedge splitting head for a log splitting apparatus equipped with a ram for axially advancing pre-cut logs toward the splitting head in a horizontal direction includes a vertically oriented stationary post and a stationary triangular splitting wedge disposed between the post and the log to be split. The post holds upper and lower multiple splitting wedge assemblies which can be slideably positioned on the post by hydraulic cylinder/piston units. The triangular splitting wedge severs a log into two pieces. The wedge assemblies then sever the initially produced two pieces into smaller pieces, the number of which corresponds to the number of blades in the assembly positioned to interact with the log.



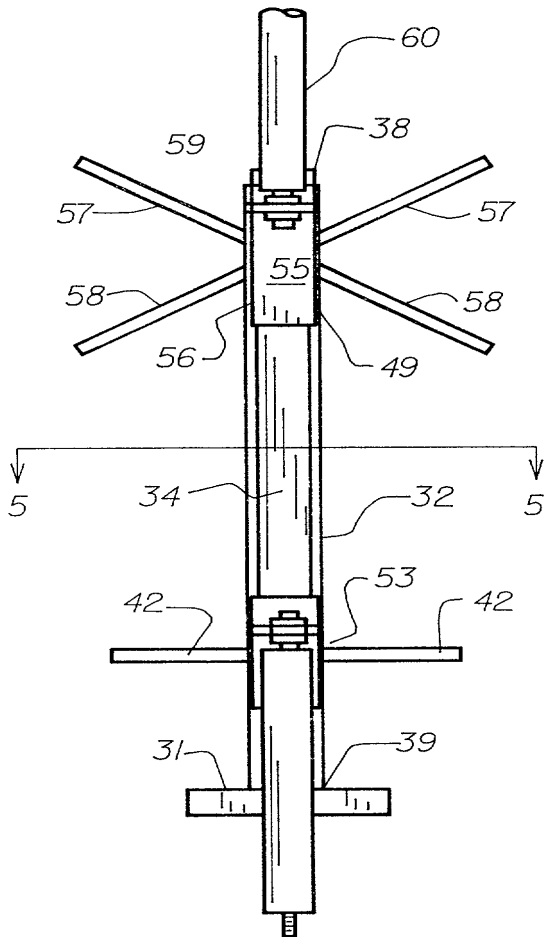


FIG. 3

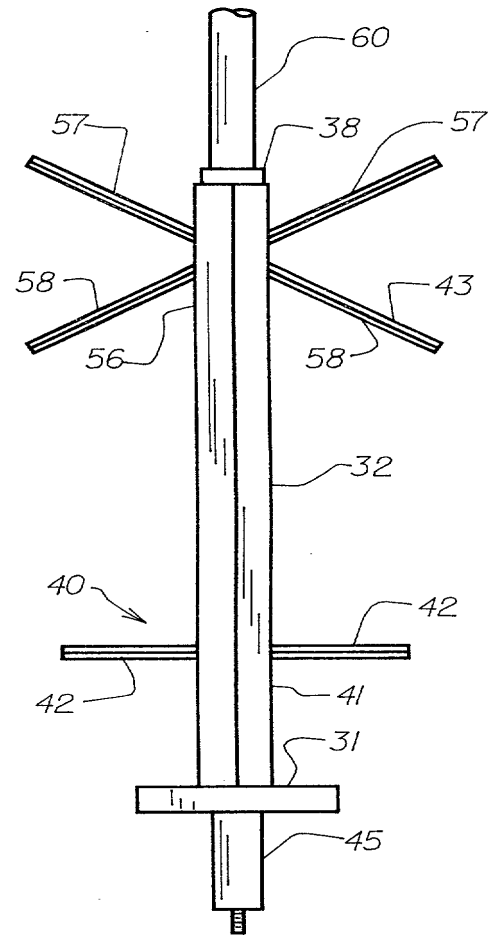


FIG. 4

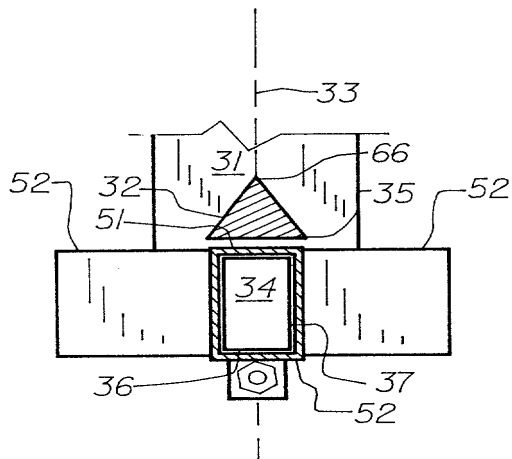
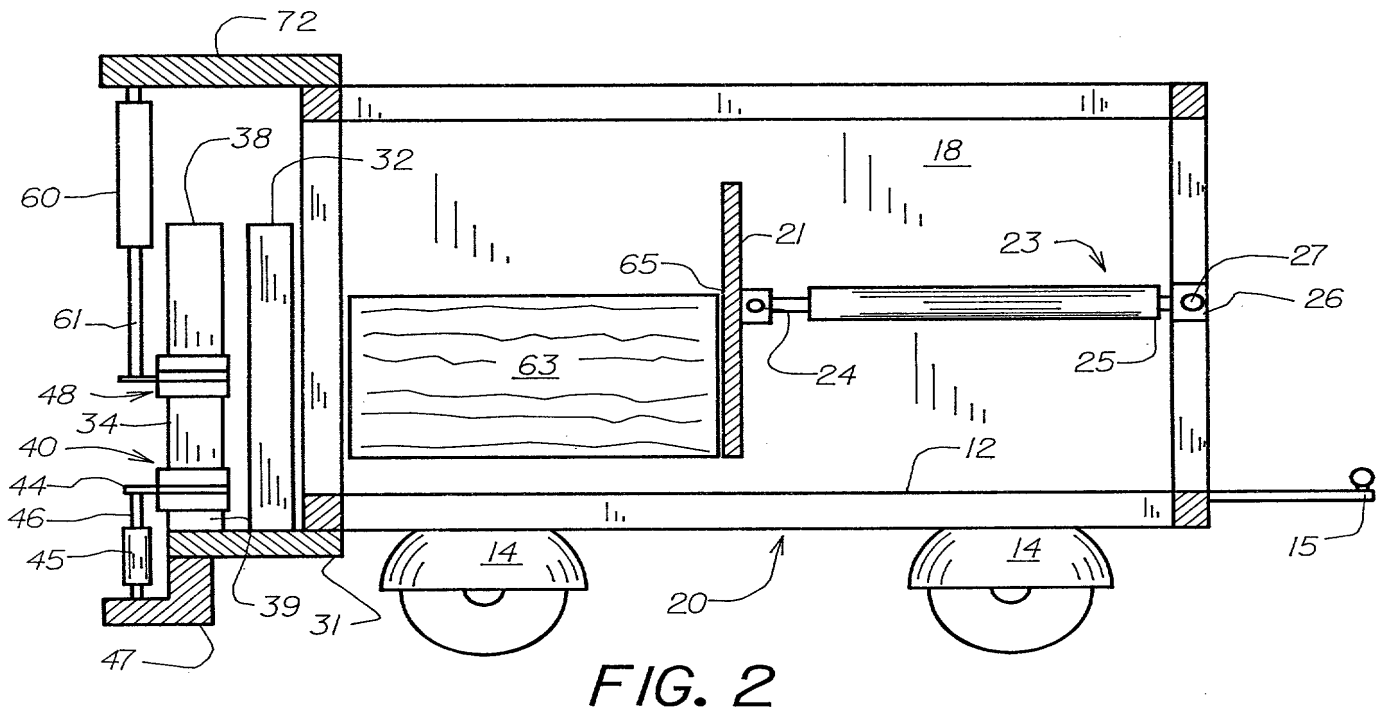
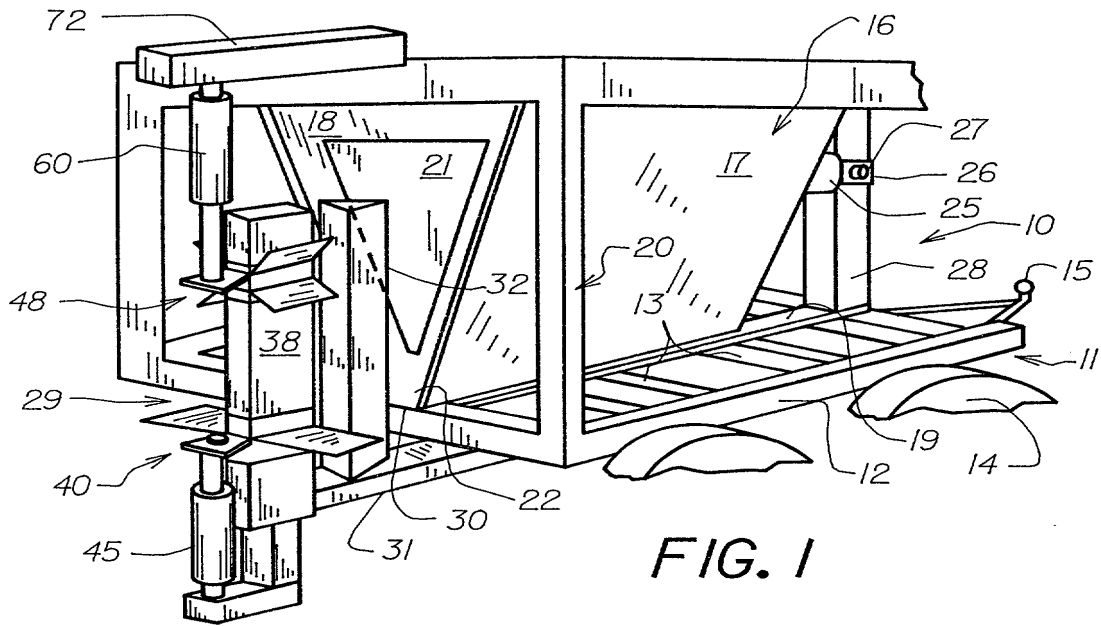


FIG. 5



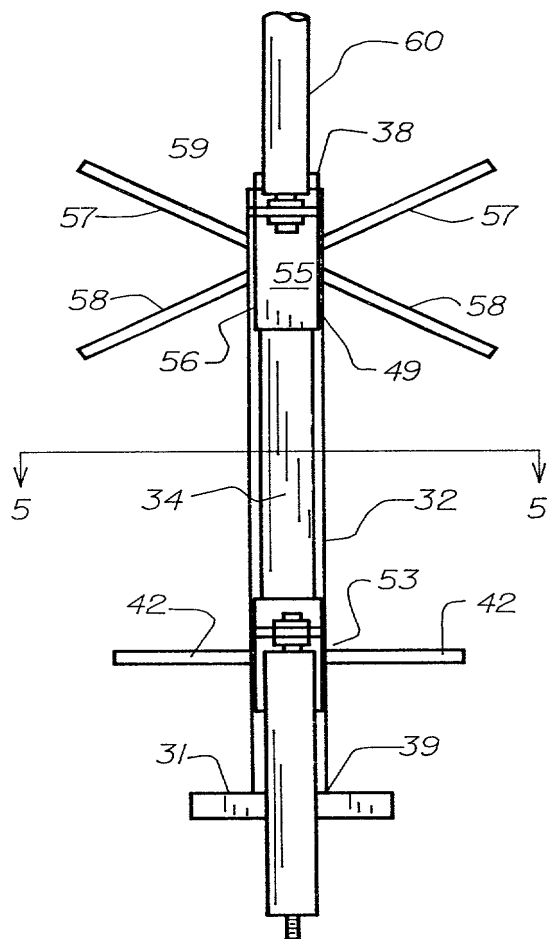


FIG. 3

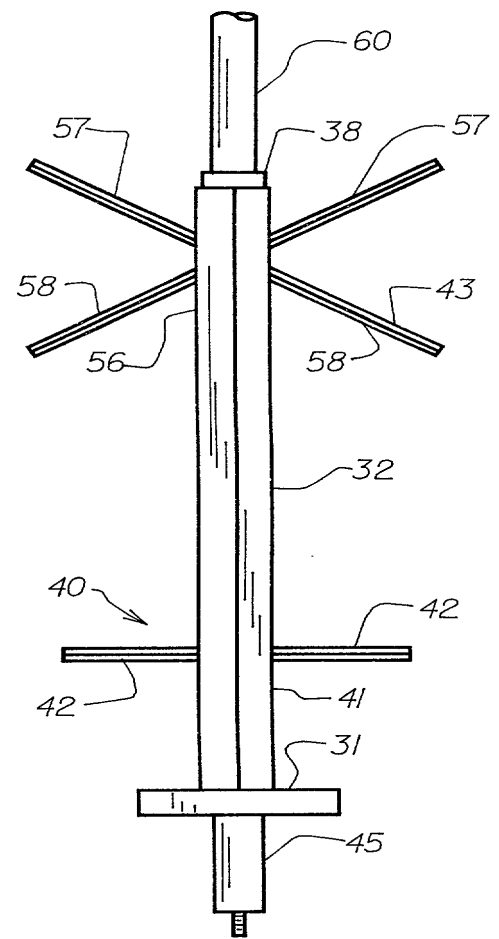


FIG. 4

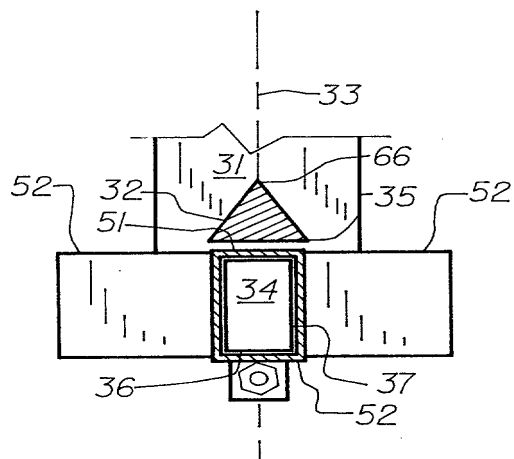
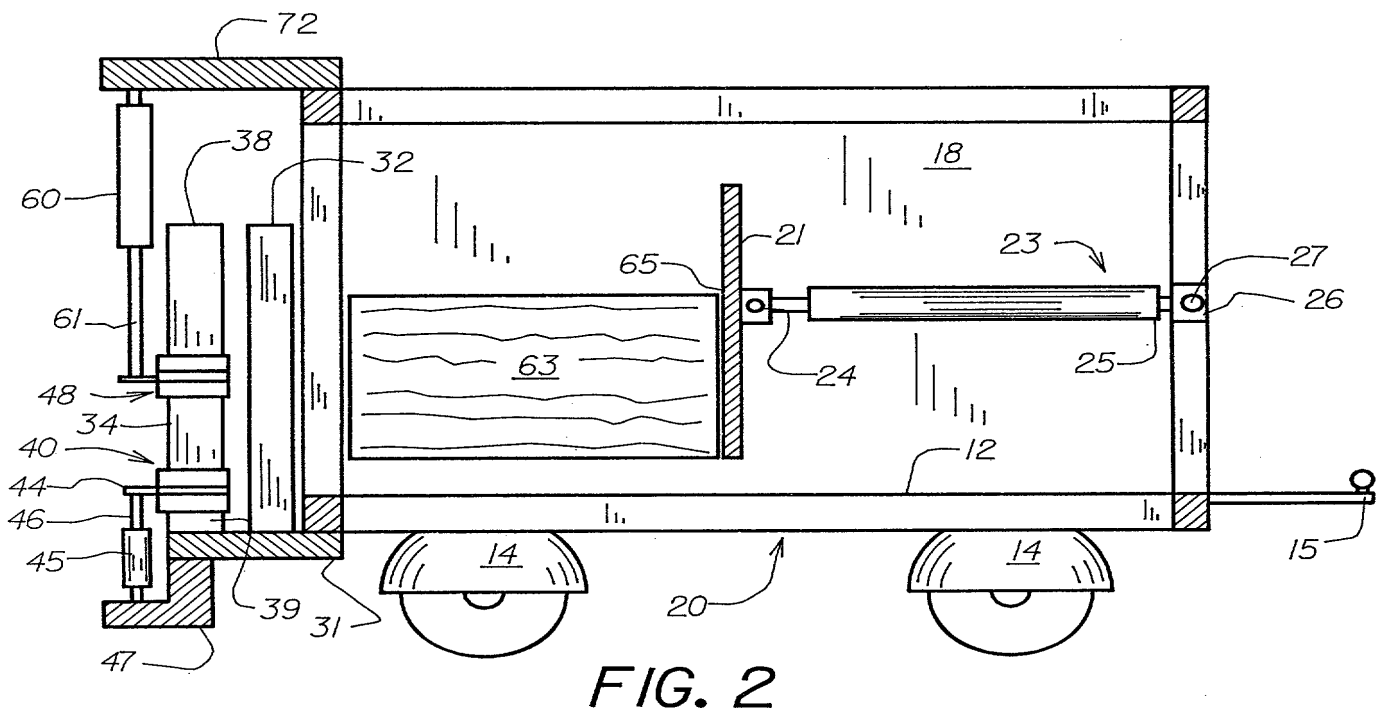
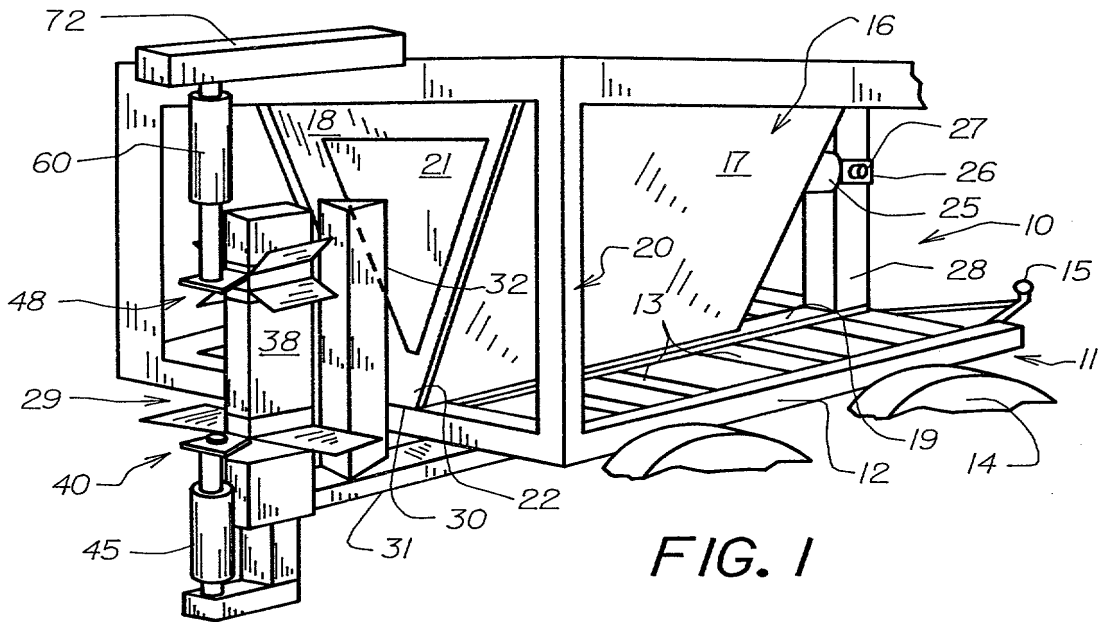


FIG. 5





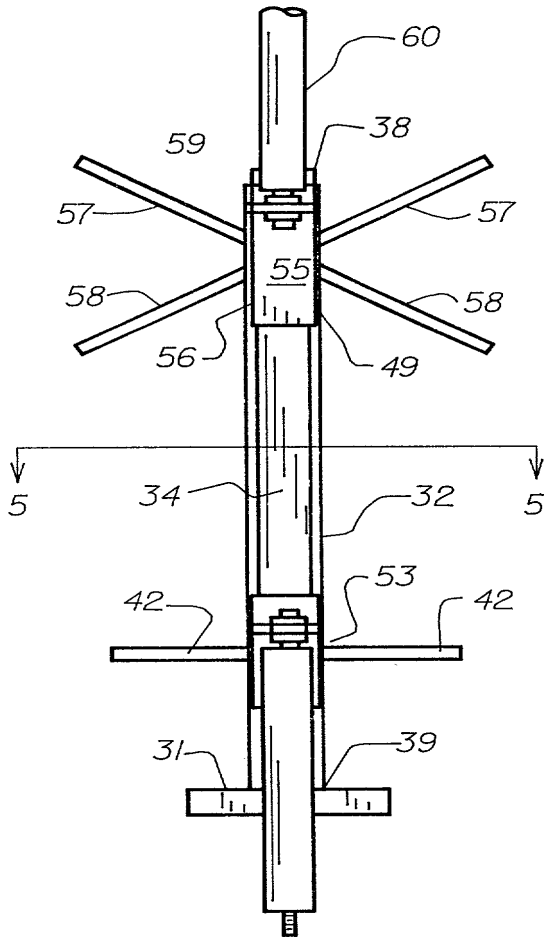


FIG. 3

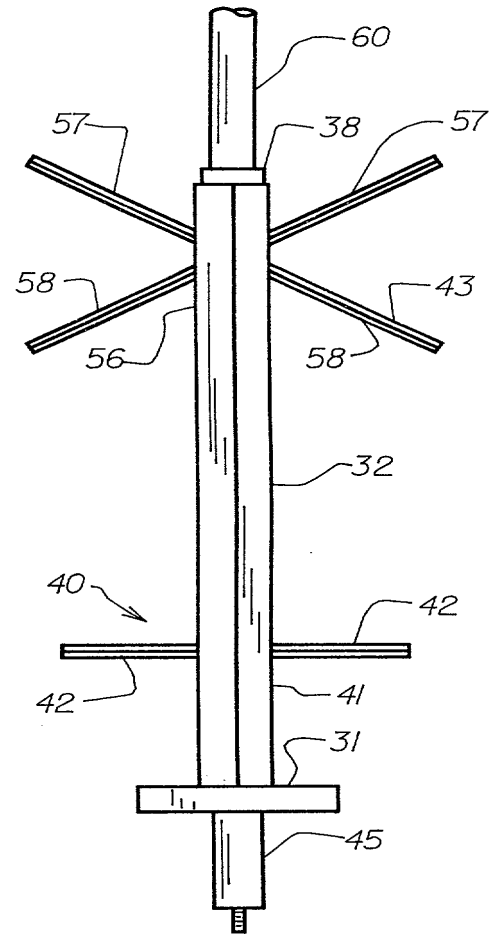


FIG. 4

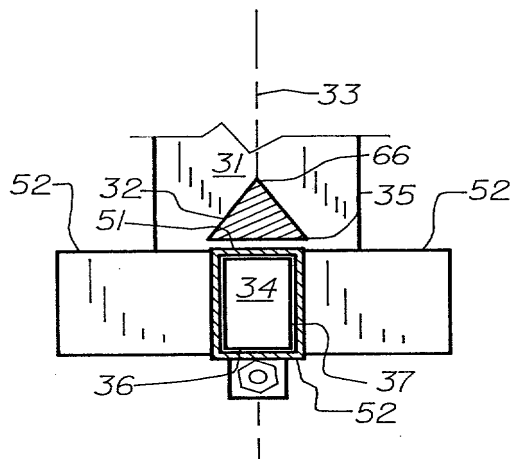


FIG. 5

MATERIAL INFORMATION DISCLOSURE

With respect to the invention described in the attached specification, and pursuant to 37 CFR 1.97 - 1.99, the following is the closest prior art of which the Applicant and the preparer of the specification are aware :

Patent No.	Inventor	Issue Date	Class/Subclass
4,294,295	Olin	Oct. 1981	144/3
4,353,401	Schilling	Oct. 1982	144/193
4,371,019	Jeffrey	Feb. 1983	144/193
4,371,020	Barnes et al.	Feb. 1983	144/366
4,391,312	Sakraida	Jul. 1983	144/193
4,860,806	Brace	Aug. 1989	144/193
5,287,902	Keantelot	Feb. 1994	144/366

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DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

ADJUSTABLE LOG SPLITTING HEAD,  
the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Norman B. Rainer, Registration No. 18,925

Address all telephone calls to Norman B. Rainer at telephone no. (804) 288-7109.

Address all correspondence to :

Norman Rainer & Associates  
2008 Fon Du Lac Road  
Richmond, VA 23229

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor John R. Smith  
Inventor's signature [Signature] Date 2/3/97  
Residence Ludlow, Vermont Citizenship U.S.A.  
Post Office Address 152 East Hill Rd., Ludlow VT 05149

Full name of second joint inventor, if any \_\_\_\_\_  
Second Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_  
Residence \_\_\_\_\_ Citizenship \_\_\_\_\_  
Post Office Address \_\_\_\_\_

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Applicant or Patentee: John R. Smith  
Serial or Patent No.: \_\_\_\_\_  
Filed or Issued: \_\_\_\_\_  
For: ADJUSTABLE LOG SPLITTING HEAD

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled same as above described in \_\_\_\_\_

- ☒ the specification filed herewith  
☐ application serial no. \_\_\_\_\_, filed \_\_\_\_\_  
☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern, or organization  
☐ persons, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR NAME OF INVENTOR NAME OF INVENTOR

John R. Smith

Signature of Inventor

Signature of Inventor

Signature of Inventor

Date

Date

Date

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